



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
P.O. Box 21668
Juneau, Alaska 99802-1668

September 9, 1997

MEMORANDUM: Rolland A. Schmitten
Assistant Administrator

FROM: Steven Pennoyer *[Signature]*
Administrator, Alaska Region

SUBJECT: Determination of the occurrence of a disaster in
the Bristol Bay and Kuskokwim River Salmon
Fisheries in Alaska in 1997

Governor Tony Knowles recently sent a letter to the Secretary of Commerce requesting that the Bristol Bay Sockeye and Kuskokwim River chum salmon fisheries be declared a disaster and that federal assistance be provided as indicated under the Magnuson-Stevens Fisheries Management Conservation Act on August 11, 1997. You have requested an assessment of this issue and a recommendation on our part. I will attempt, herein, to describe the circumstances and the relationship of this year's run and return, the past, and potential relationships. While gross information is available on the magnitude of "loss" compared to expectations in these fisheries, we have no data on the actual individual impacts or various price arrangements for post season payments, payments in-kind, etc., which might have been received by fishermen. Our assumptions have to be totally based on the general price paid and the poundage landed as opposed to what was expected even if we have no specific data on the income that would have been derived from a run of the size anticipated.

The definition and circumstances under which a "disaster" can be declared and the level of program assistance which would result from this declaration are not at all clear to us. In general, disasters in salmon runs particularly may be very problematical since each year's run is an entity unto itself and is probably affected selectively and differently by both natural and anthropogenic factors. The history of salmon runs in Alaska is one of extreme fluctuation and interannual variability. This has been less true during the last 20 years due to extremely good natural survival, (coupled with good management), where harvests have averaged over 100 million fish per year and have gone as high as 200 million fish per year. In contrast, harvest in the early 1970's sunk as low as 23 million fish statewide. We have enjoyed a period of very high natural survival, both in fresh water and in the ocean.



I don't think anybody can predict what long term effects the current warming trends will have and whether we are going to again enter into periods such as experienced in the 40's, 50's, and 60's which reflected generally lower returns and extreme fluctuation.

As you can see from the attached chart, the historic Bristol Bay forecast errors have varied significantly over the years (attachment 1). The 1997 forecast anomaly as the percent deviation between the actual and forecasted total run of -78.1% was the lowest observed. The Bristol Bay forecasts have been quite variable with percent deviations ranging from +54% to -78%, with forecasted runs tending to be higher than actual runs during the 1960's and early 1970's and forecasted runs lower than actual runs thereafter. Beginning in 1993, the Bristol Bay forecast methodology was modified to correct the under forecast bias which had occurred since the early 1970's. Here the standard Bristol Bay forecast was inflated by the recent ten-year average prediction error. This adjustment contributed to the large negative forecast anomaly observed in 1997.

I don't know if it is a disaster as defined by the MSFMCA to make a prediction based upon the best scientific evidence available only to see actual returns fall short of expectations or whether below average returns are a "disaster" be it predicted or not. I will tell you having been a salmon forecast biologist for many years that the norm in years of poor survival has been to misforecast (generally on the high side). The 1960's variations in forecast of up to 100% were not uncommon and mostly due to variable marine survival. In fisheries where escapement data may be poor, estuarine data is missing, and there is a lack of marine survival information, forecasting is a real crap shoot. The point I'm getting at is that you can't just look at the last 20 years in hopes of anticipating what might be coming and how an economic declaration may effect federal actions.

In the case of species with extreme natural variation, an economic declaration based on poorer than expected returns could set precedence, (depending on the level and type of aid required), that will be far reaching if the next decade exhibits poor ocean survivals and lower than expected returns become the norm. The art of forecasting usually leads to under-forecast as runs and survivals are increasing and over-forecast as they are decreasing.

Comparison of historical observed and projected catches for Alaskan sockeye and pink salmon fisheries from 1970-1997 show considerable variation around the state (attachments 2-10).

I would point out that there is considerable uncertainty in the Alaska Department of Fish and Game's catch projections. Percent deviations for various sockeye salmon fisheries range from +100% to -150%, and various pink salmon fisheries range from +100% to -300%. There appears to be a west to east cline in the observed 1997 catch forecast deviations, with both sockeye and pink salmon fisheries in the Bering Sea and western Gulf of Alaska having catches substantially below projections and sockeye and pink salmon fisheries in the central Gulf of Alaska, Southeast Alaska, and British Columbia having catches slightly below to above projections. This indicates that a decline in survival for cohorts contributing to the 1997 run has occurred for sockeye and pink salmon stocks in the Bering Sea and western Gulf of Alaska. Note that full magnitude of this decline in survival for sockeye cannot be fully evaluated until the returns from cohort escapements are complete (i.e., after the 1999 run). Despite the unexpected shortfall in certain fisheries, the statewide harvest still exceeded 100,000,000 fish!

Bristol Bay and the Kuskokwim River, the most stated "failures", aren't the only two examples of areas which have experienced run failures. We have not been requested to deal with these other issues, but in fact, could they not deserve the same type of consideration if so requested?

The concern for Bristol Bay runs in particular led to the State of Alaska Governor's office to request a meeting with professional staff in the Alaska Department of Fish and Game, the National Marine Fisheries Service and the University of Alaska to discuss the possible causes for this low return and the implications for future years (if any). Accordingly, the State and National Marine Fisheries formed an informal task force chaired by Dave Benton and myself to look into the various factors which may be affecting this year's Bristol Bay return.

A number of people were assigned tasks varying from discussions of overall productivity in the Bering Sea to specific run data in 1997 versus forecast.

These reports are coming together and within the next week or so we should have a summary of where we stand in this regard. It is anticipated that once we have some of this information in writing we would convene a meeting of interested people to discuss the information and its implications for future management both by us and the industry. It is my feeling that we might have some short term indications of some of the things that did or did not effect this years run, but it will take quite a bit more time to evaluate the long term implications.

This is an area where I could see aid being focused - namely to finance meetings or studies to bring together people and information to address this problem.

As an aside, Dr. Mike Dahlberg of the Auke Bay Laboratory was charged with looking at the high seas survival and interception questions. Our general feeling was that interceptions, given what we know about enforcement of the high seas driftnet act, are probably not a major factor contributing to the diminishing of the run. There may in fact be fisheries going on in the Russian zone that are beyond what we thought the Russians had agreed to, which was to contain directed fishing for salmon, including joint venture operations, within 25 miles of their coast, between 170 degrees East longitude and 143 degrees 53 minutes and 36 seconds West longitude north of 50 degrees North latitude. These operations may be intercepting some of our fish, but it is unlikely that enough of our sockeye are in their zone for this to have significant effect on the total run size. This is not to say that this question should not be addressed if other parties are not living up to their agreements, they should be held accountable.

In the case of Bristol Bay during 1997, the actual harvest is one of the lowest in the last 20 years with no more than half of the forecasted return (attachment 11). Near as we can tell, the total economic impact on the Bay of the actual run size versus anticipated is approximately \$63 million dollars. (The average weight of the fish was about 5.90 pounds and the average price per pound was \$0.85, the anticipated catch was 146,320,000 pounds, and the actual catch was 72,850,000 pounds (attachment 12)).

As for the Kuskokwim River, the 1997 outlook was for a commercial harvest of 160-410 thousand chum salmon. Additionally, the outlook called for 580-870 thousand coho salmon to be harvested. It was anticipated that 4-year old chum salmon in 1997 would be returning from the poor parent-year escapements observed in 1993. However, the actual commercial harvest was much poorer than anticipated, with a final catch of only about 67 thousand chum salmon. Coho salmon also fell well below anticipated levels, with a commercial catch of only about 166 thousand fish. Because of the poor returns and escapements concerns, the Alaska Department of Fish and Game followed a very conservative approach to commercial fisheries in both the Kuskokwim Bay and River fisheries and closed the commercial fisheries sooner than anticipated.

Rollie, I'm not sure again what disaster aid is envisioned in the act or how it would be funded. I will tell you there is no money in the regional budget to fund anything of the magnitude that would achieve an appreciable dent in a loss of income individuals have realized or what they have experienced over the last 20 years. I also would hesitate to predict what's going to happen over the next 10 years or so. The El Niño effects being felt in the lower 48 strongly coupled with the unusual warming in Alaskan waters and the possible effects on survival this year might mean a dramatic change in run sizes can be anticipated in the near future.

In any case, if in fact extreme run variability can be expected over the next few years, then I don't know what the declaration of a disaster will mean in a longer term context. You might be buying into something where it is going to be extremely difficult to fulfill people's expectations.

As an aside, I would tell you that variation in price of salmon relative to run size may not make for a "natural disaster", but can have extreme influence on how good a season is for fishermen. I don't know how we anticipate control or take this into account.

As a recommendation, we may wish to consider convening a workshop with representatives from the coastal states to interact and help define threshold criteria in formulating conditions which would constitute an "economic disaster." Absent any standards, if you will, I suspect we would have to deal with this issue(s) on a case by case basis and maybe that is appropriate. However, at the present time, it appears we are unclear as to the intent of Magnuson-Stevens Act and better definition needs to be made.

Attachments

cc: David Evans
Gary Matlock
Bill Hines

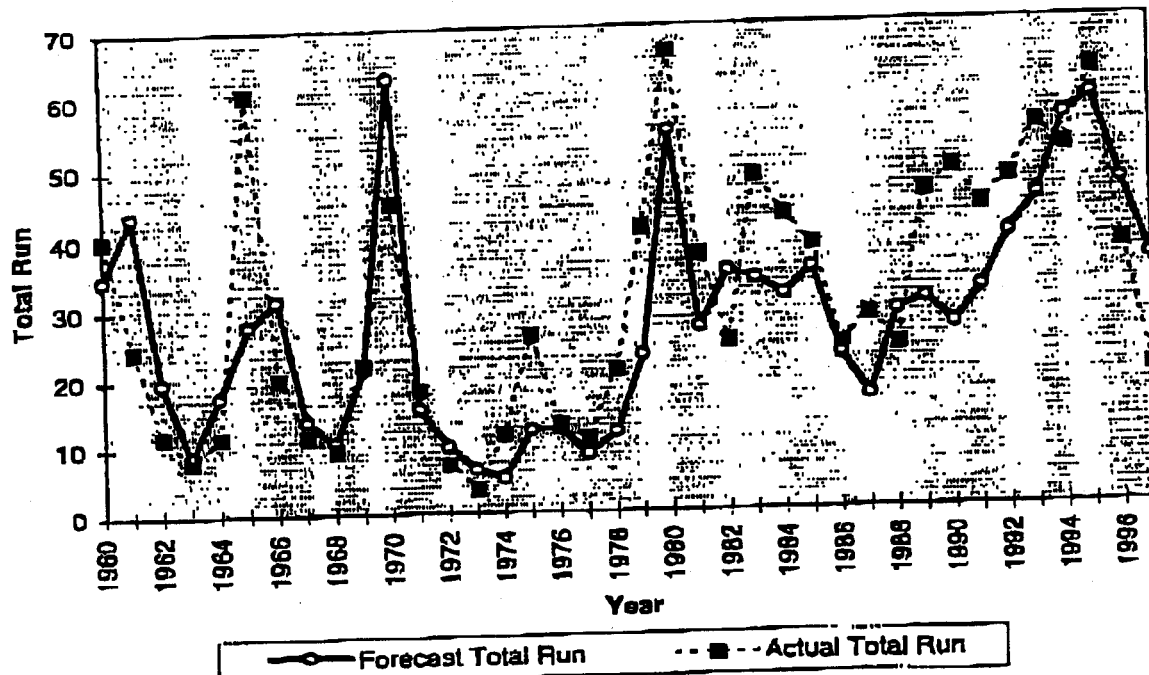
summary

ATTACHMENT 1

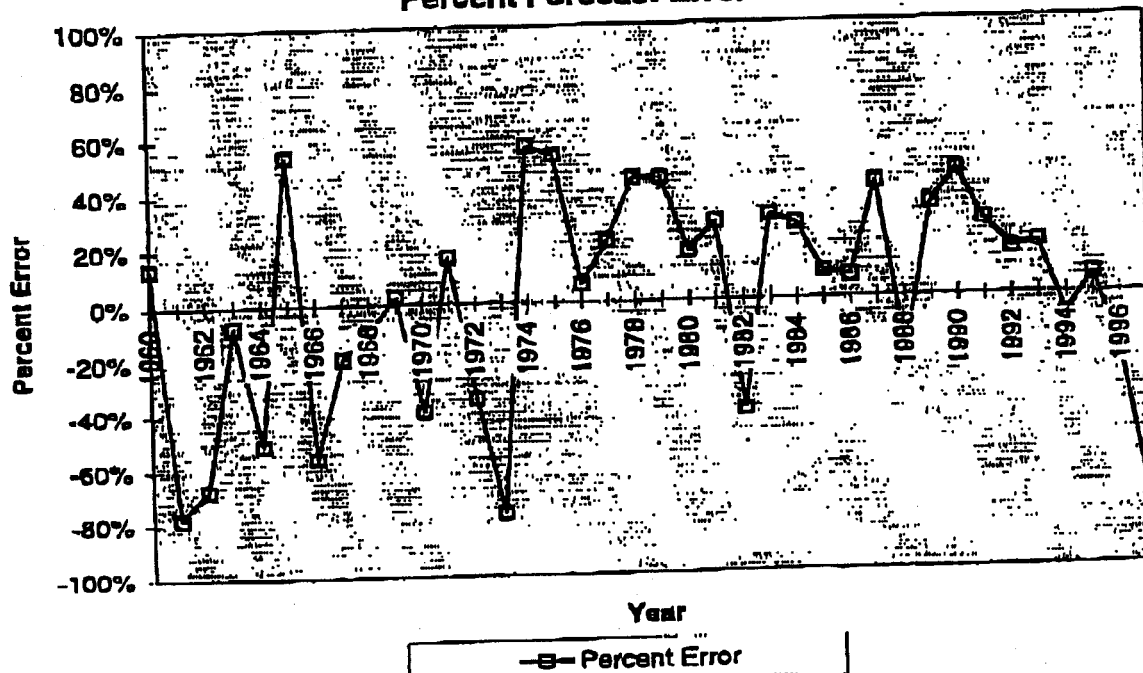
Historic Bristol Bay forecast errors.				
Year	Forecast Total Run	Actual Inshore Run	Actual Total Run	Percent Error
1960	34.6	38.409	40.228	14.0%
1961	43.6	18.1	24.5	-78.0%
1962	19.6	10.4	11.7	-67.5%
1963	8.6	6.9	8.0	-7.5%
1964	17.4	10.9	11.5	-51.3%
1965	27.8	53.1	60.8	54.3%
1966	31.3	17.5	20.0	-56.5%
1967	13.7	10.3	11.5	-19.1%
1968	10.4	8.0	9.4	-10.6%
1969	21.3	19.0	21.9	2.7%
1970	62.7	39.4	45.0	-39.3%
1971	15.2	15.8	18.3	16.9%
1972	9.7	5.4	7.2	-34.7%
1973	6.2	2.4	3.5	-77.1%
1974	5.0	10.9	11.5	58.5%
1975	12.0	24.2	25.8	53.5%
1976	12.0	11.5	12.8	6.3%
1977	8.4	9.7	10.7	21.5%
1978	11.5	19.8	20.8	44.7%
1979	22.7	39.8	40.9	44.5%
1980	54.5	62.4	68.2	17.7%
1981	26.7	34.5	37.1	28.0%
1982	34.6	22.1	24.7	-40.1%
1983	33.4	45.8	48.0	30.4%
1984	31.1	41.0	42.6	27.0%
1985	35.0	36.6	38.5	9.1%
1986	22.5	23.7	24.4	7.8%
1987	16.5	27.3	28.3	41.7%
1988	28.8	23.2	24.0	-20.0%
1989	30.4	43.9	45.7	33.5%
1990	26.7	47.8	49.0	45.5%
1991	31.9	42.2	43.8	27.2%
1992	38.6	45.1	47.5	18.6%
1993	44.7	52.1	55.0	18.7%
1994	56.0	50.3	51.8	-8.1%
1995	58.7	60.7	62.8	6.5%
1996	46.5	36.9	37.9	-22.7%
1997	35.8	33.6	20.1	-78.1%
percent error calculated as:				
$(\text{forecast total run} - \text{actual total run}) / \text{actual total run} \times 100$				
Total Run includes estimates of interception in Japanese high seas fisheries and False Pass				

ATTACHMENT 1

Bristol Bay Sockeye Total Run (Inshore + Interceptions)

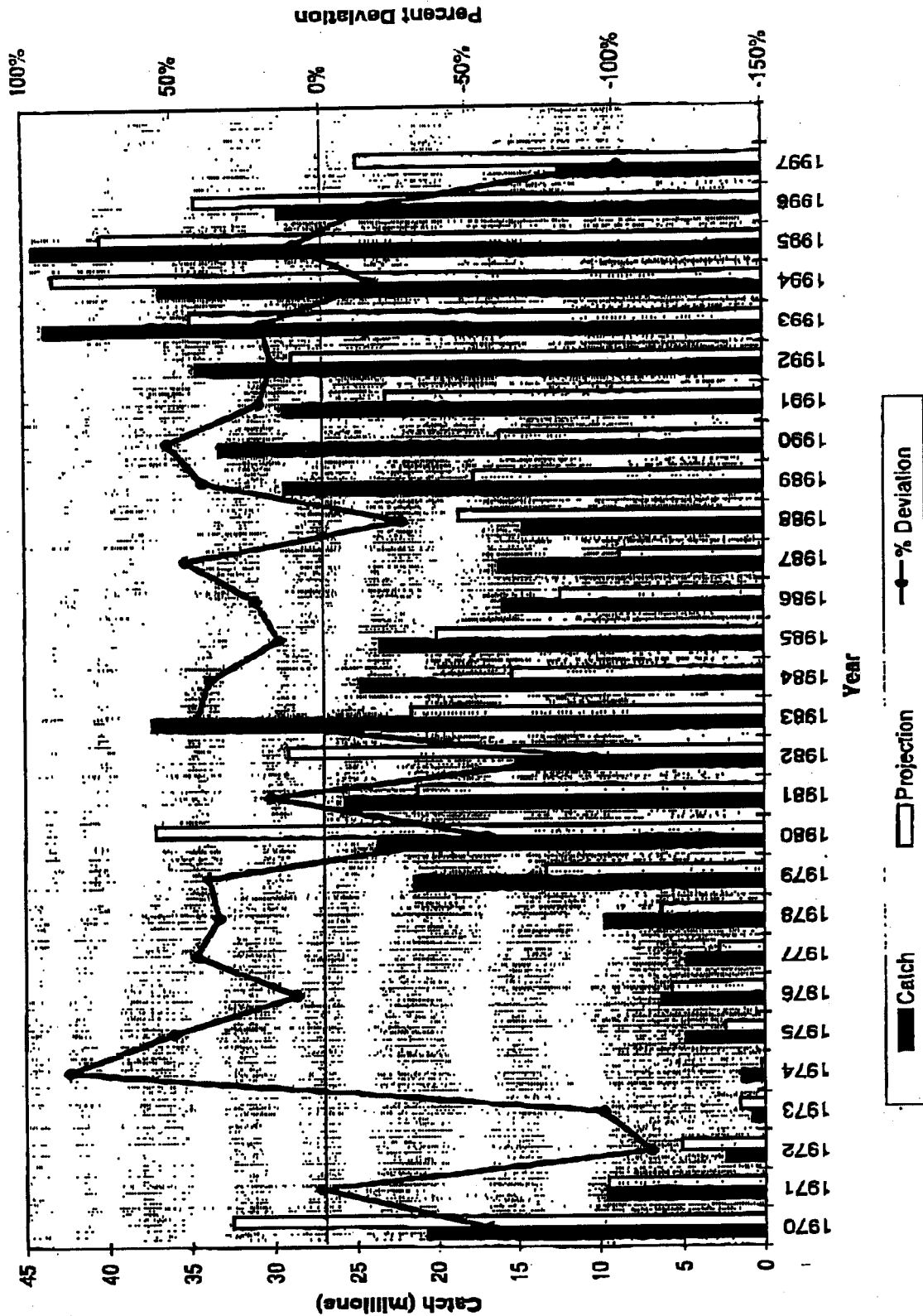


Percent Forecast Error



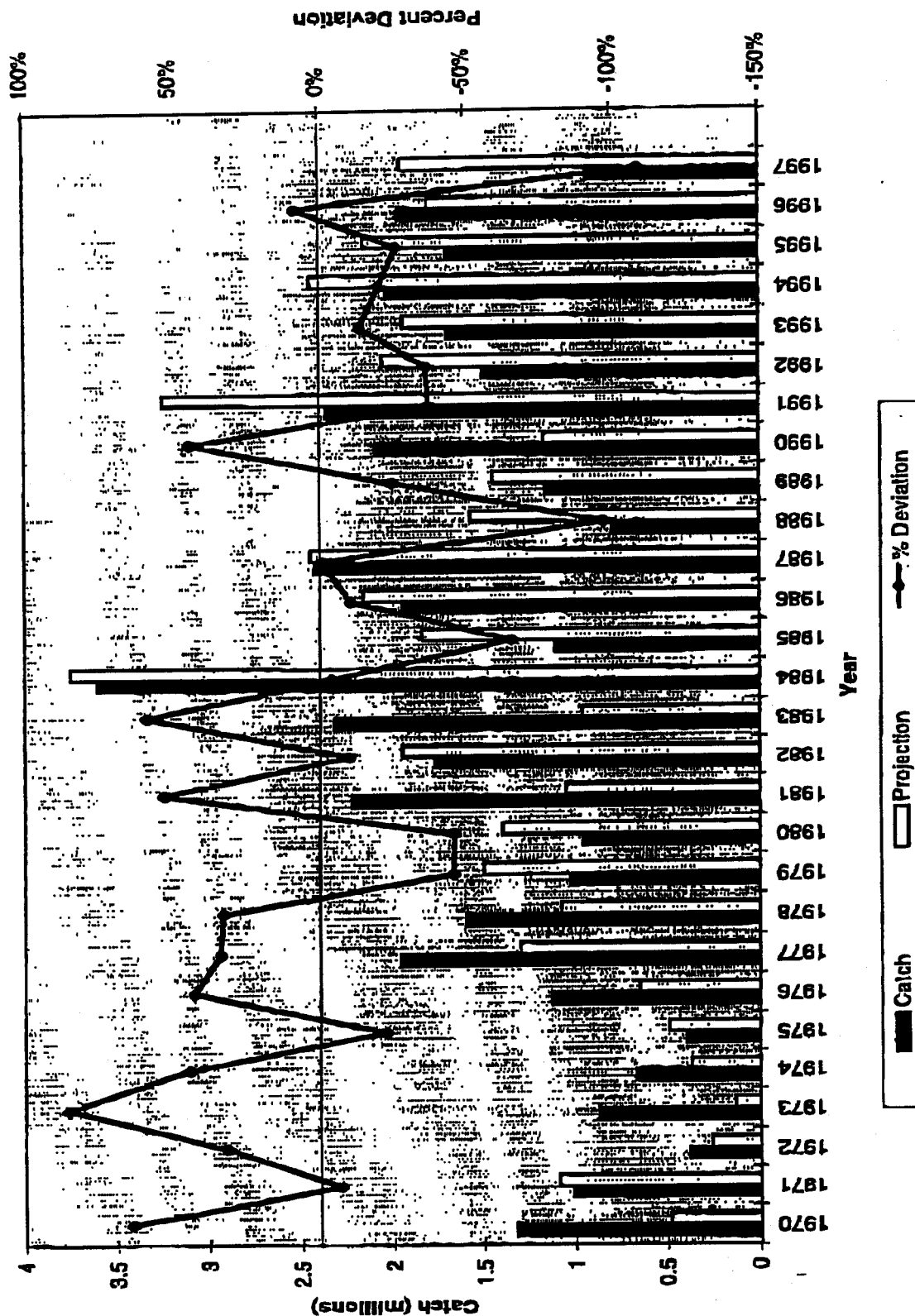
ATTACHMENT 1

Bristol Bay Sockeye Salmon



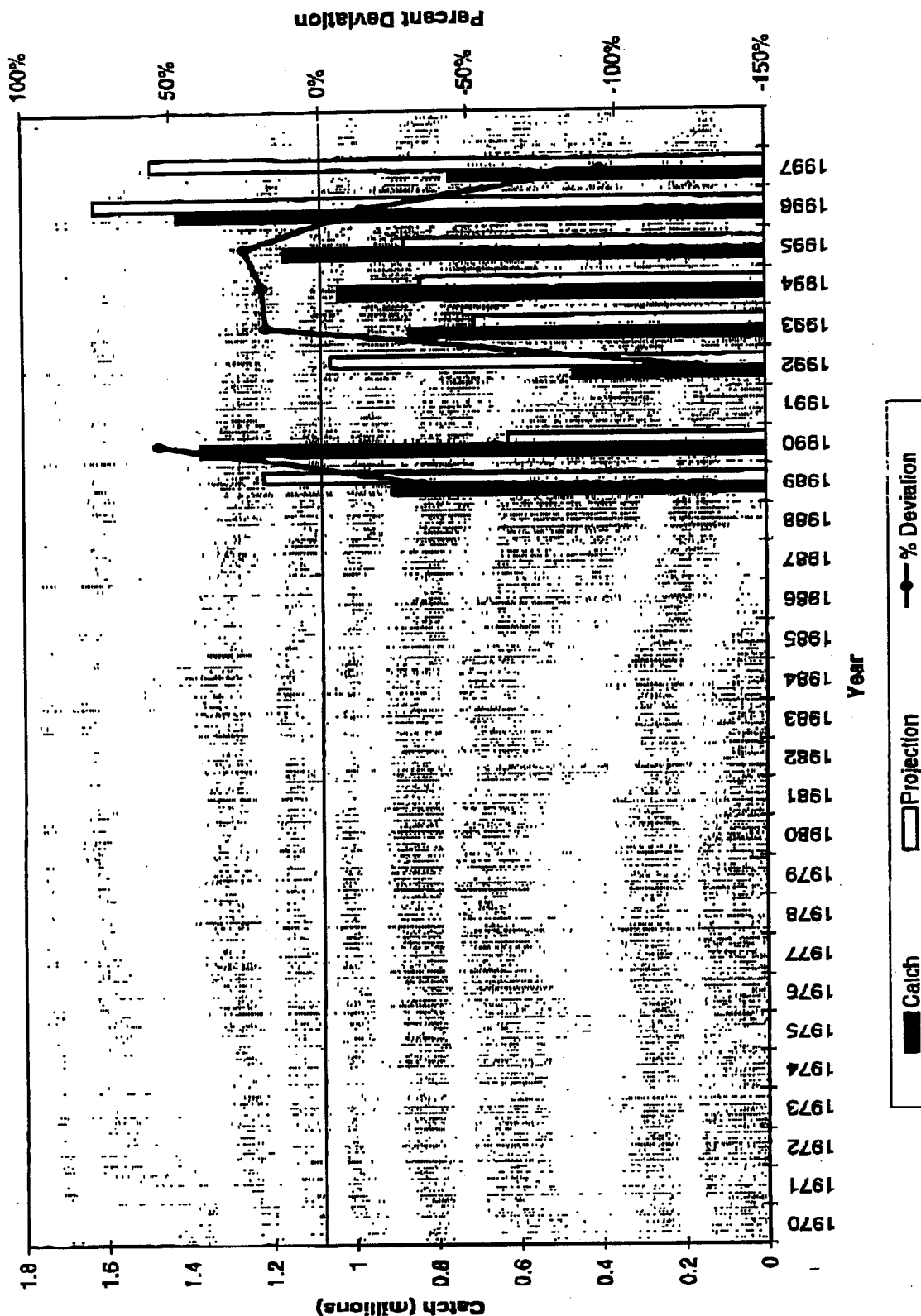
ATTACHMENT 2

Chignik Sockeye Salmon



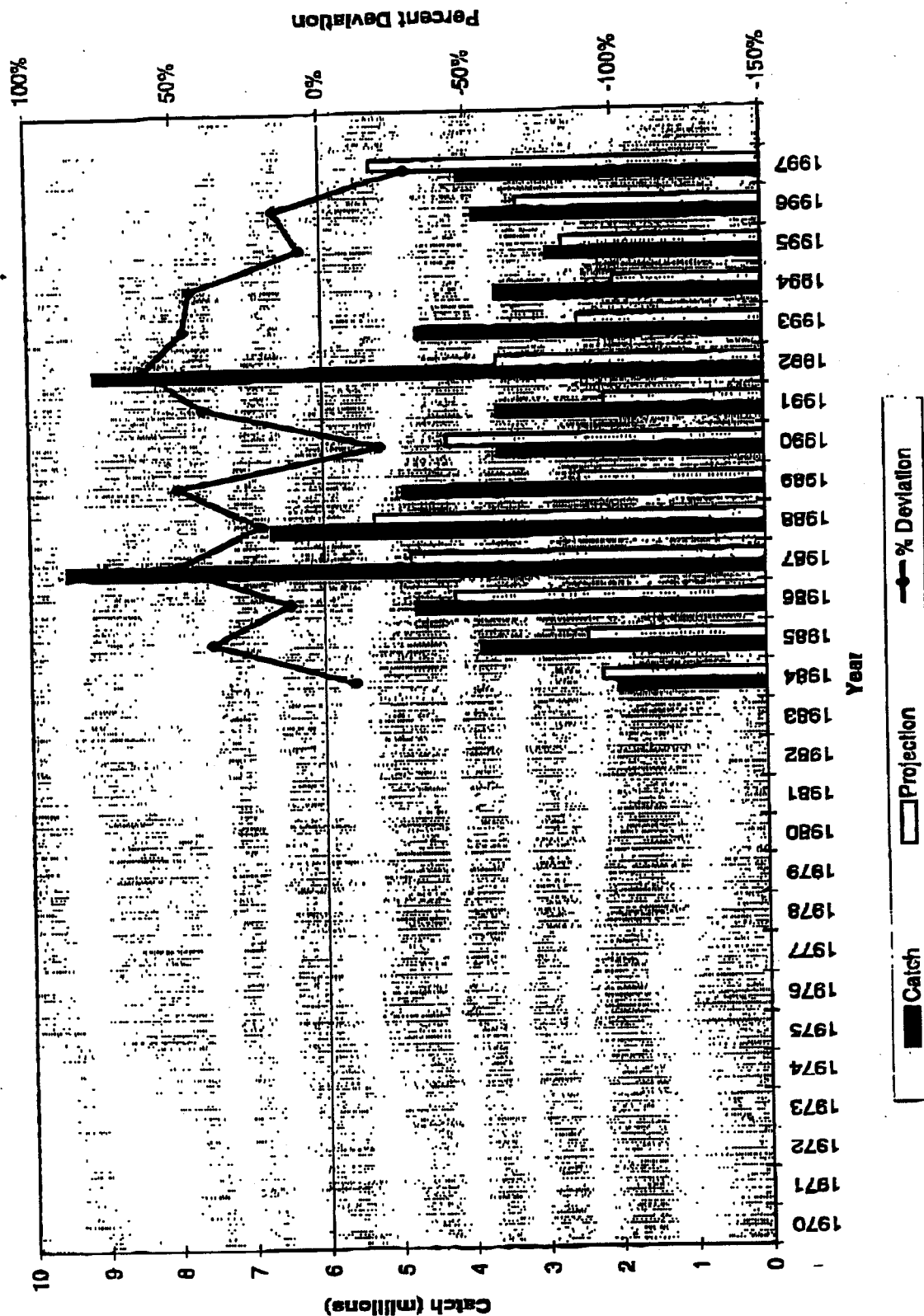
ATTACHMENT 3

Kodiak (Upper Station + Fraser) Sockeye Salmon



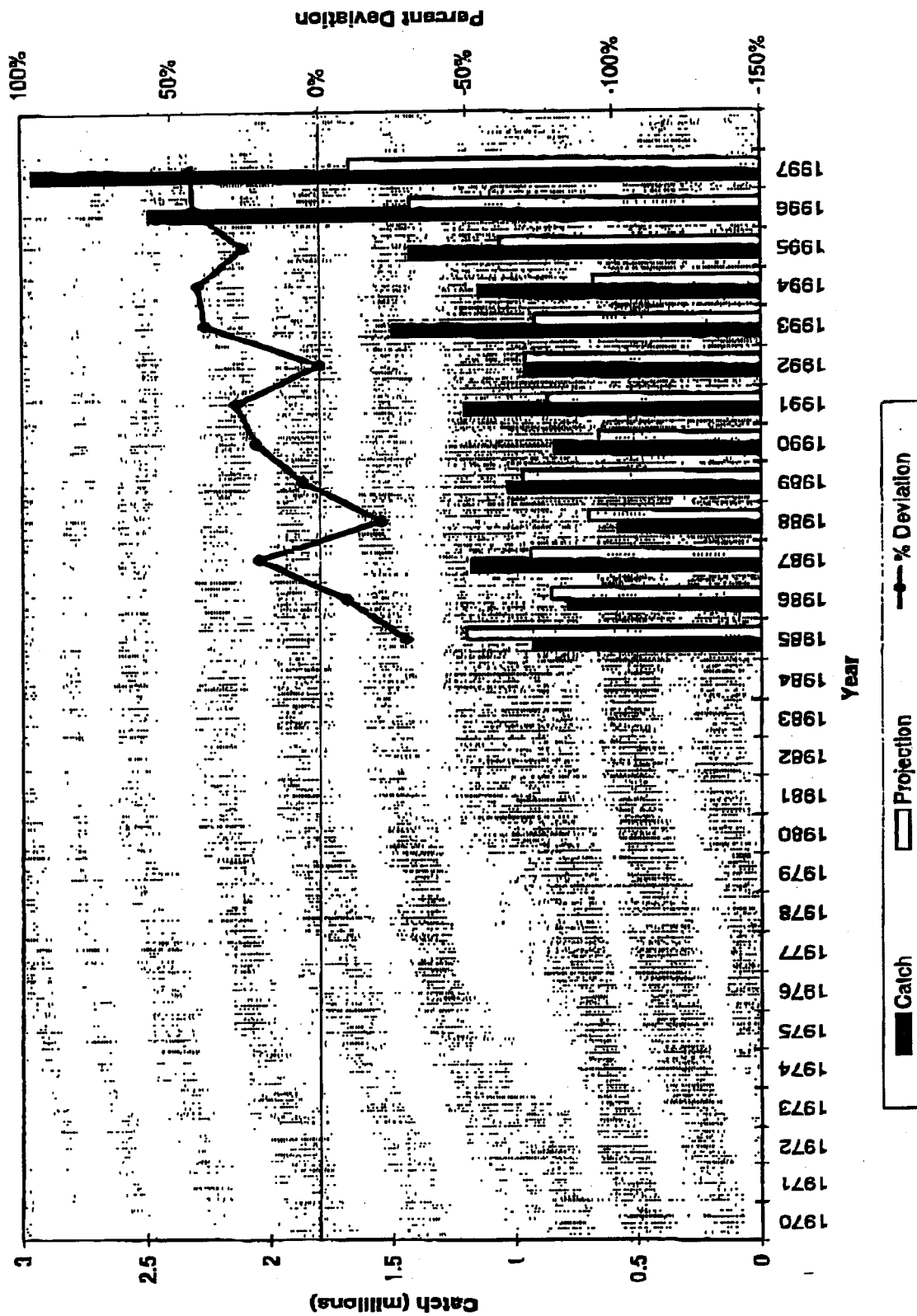
ATTACHMENT 4

Upper Cook Inlet Sockeye Salmon



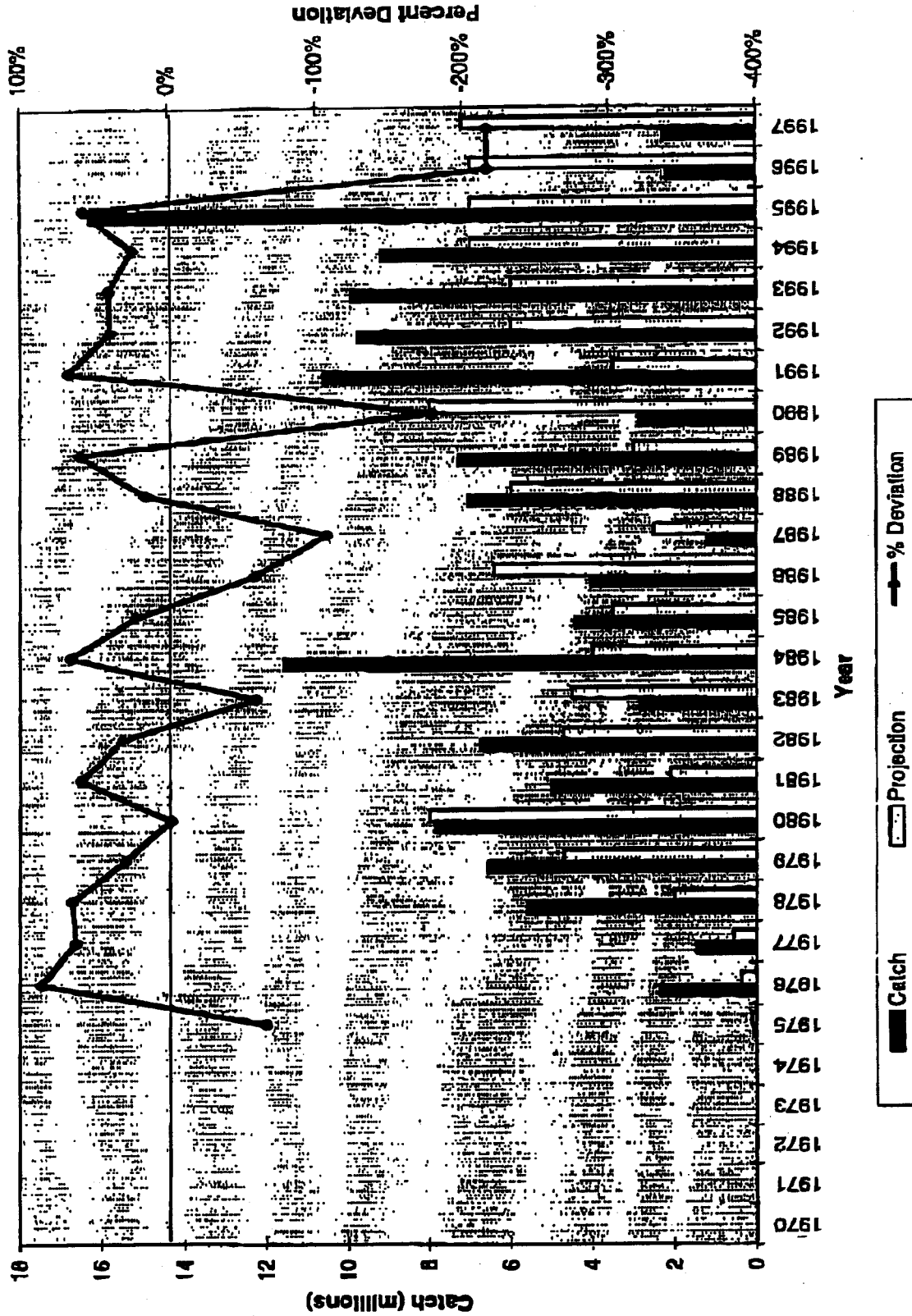
ATTACHMENT 5

Copper River Sockeye Salmon



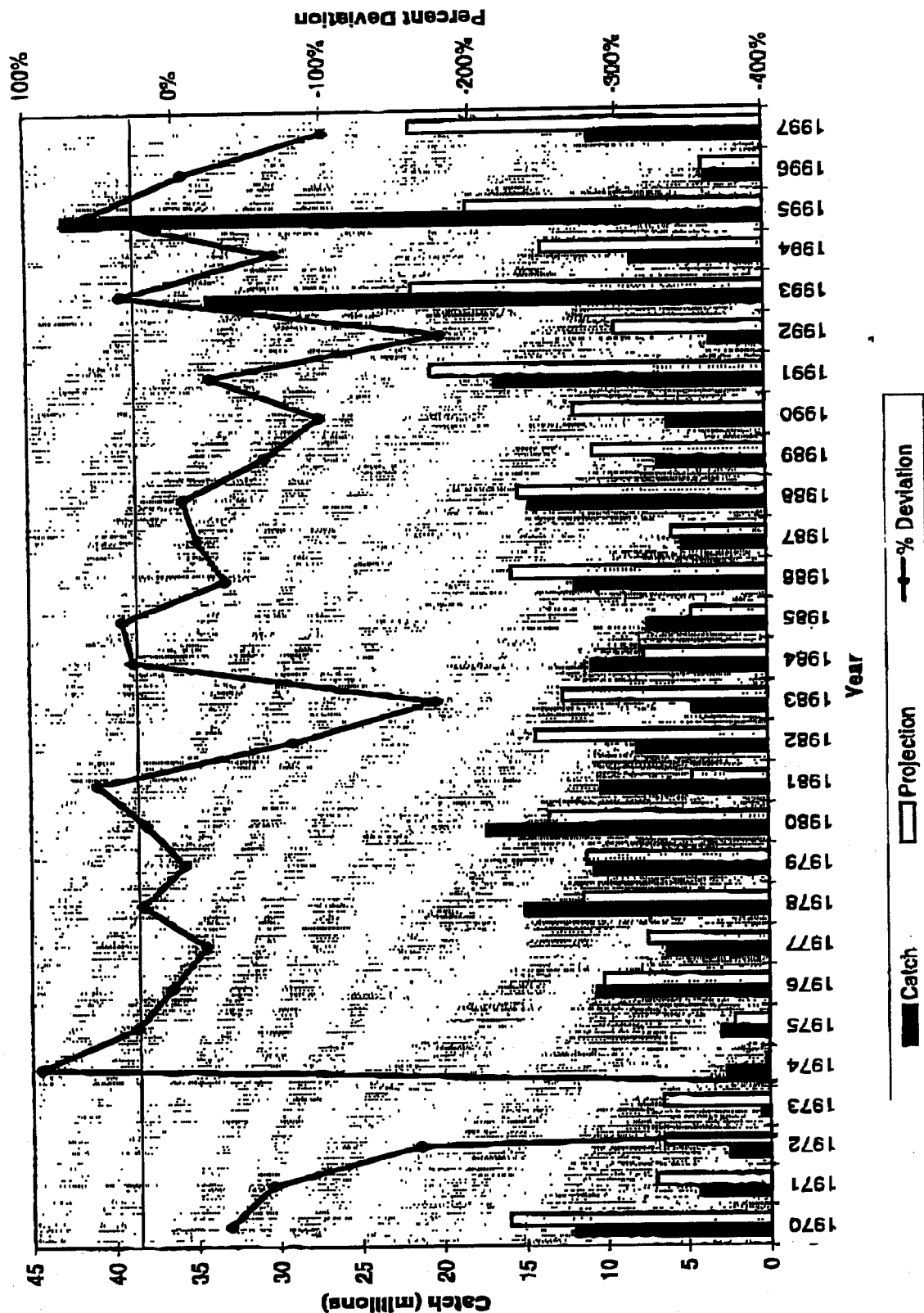
ATTACHMENT 6

South Alaska Peninsula Pink Salmon



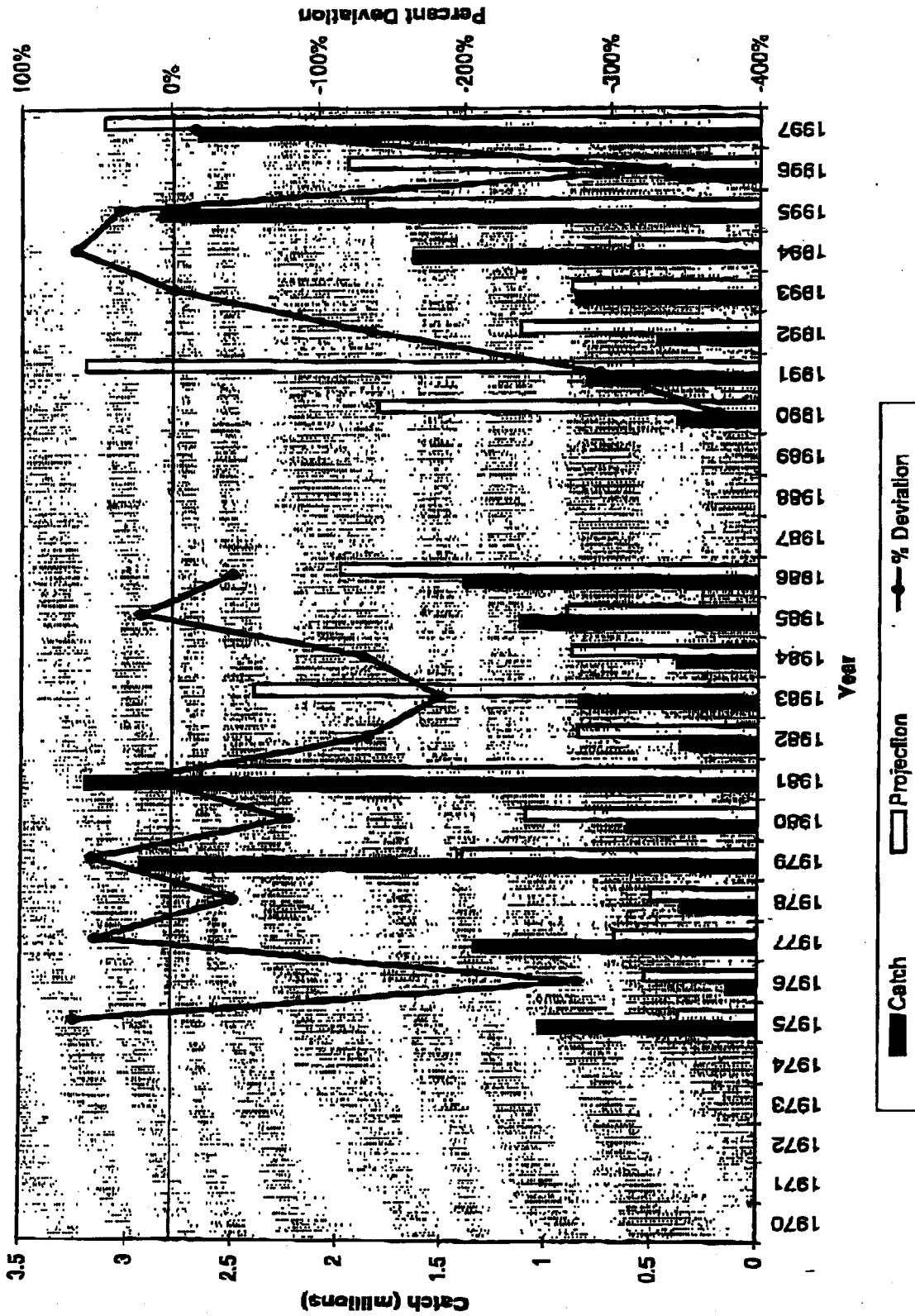
ATTACHMENT 7

Kodiak Pink Salmon



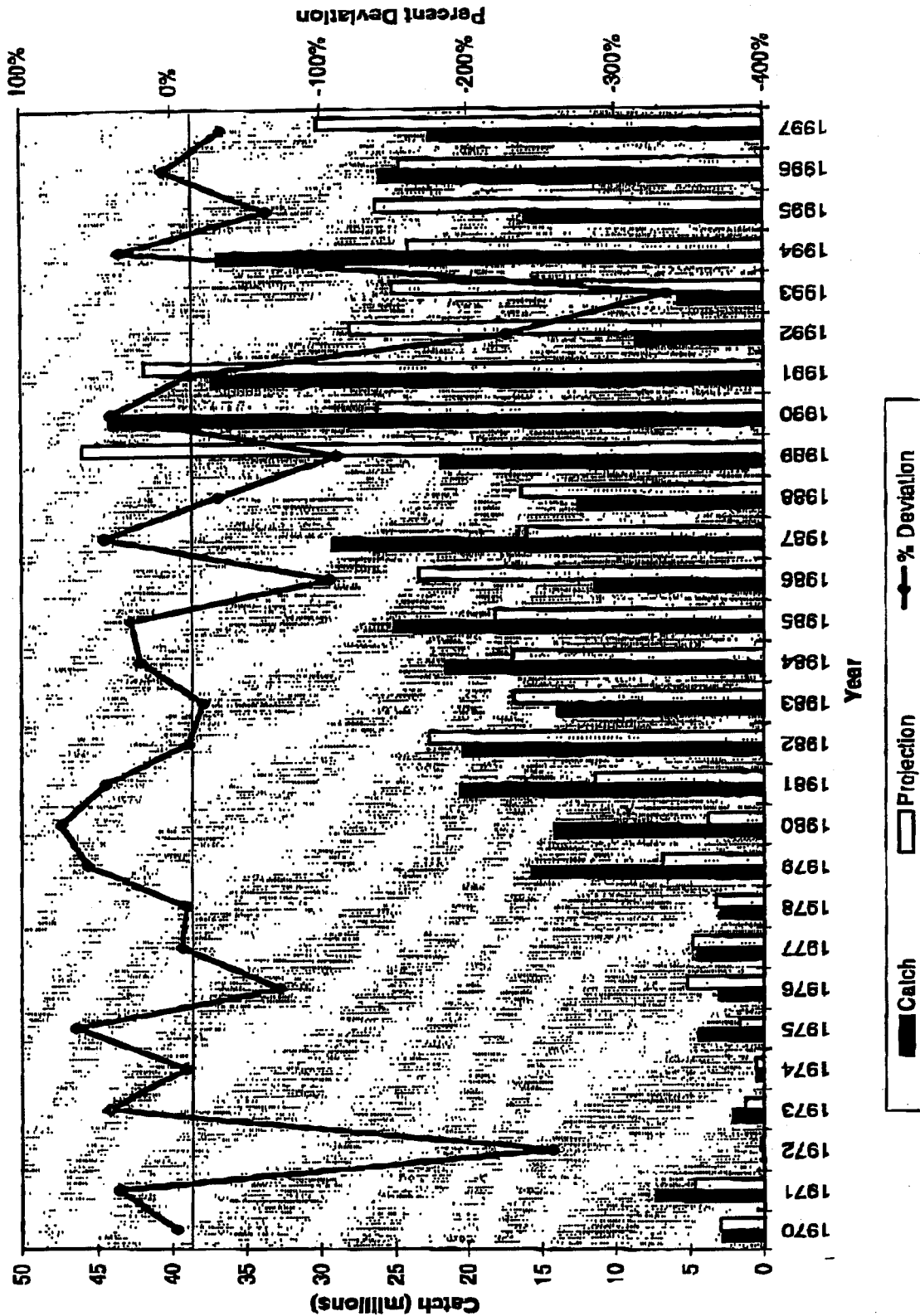
ATTACHMENT 8

Lower Cook Inlet Pink Salmon



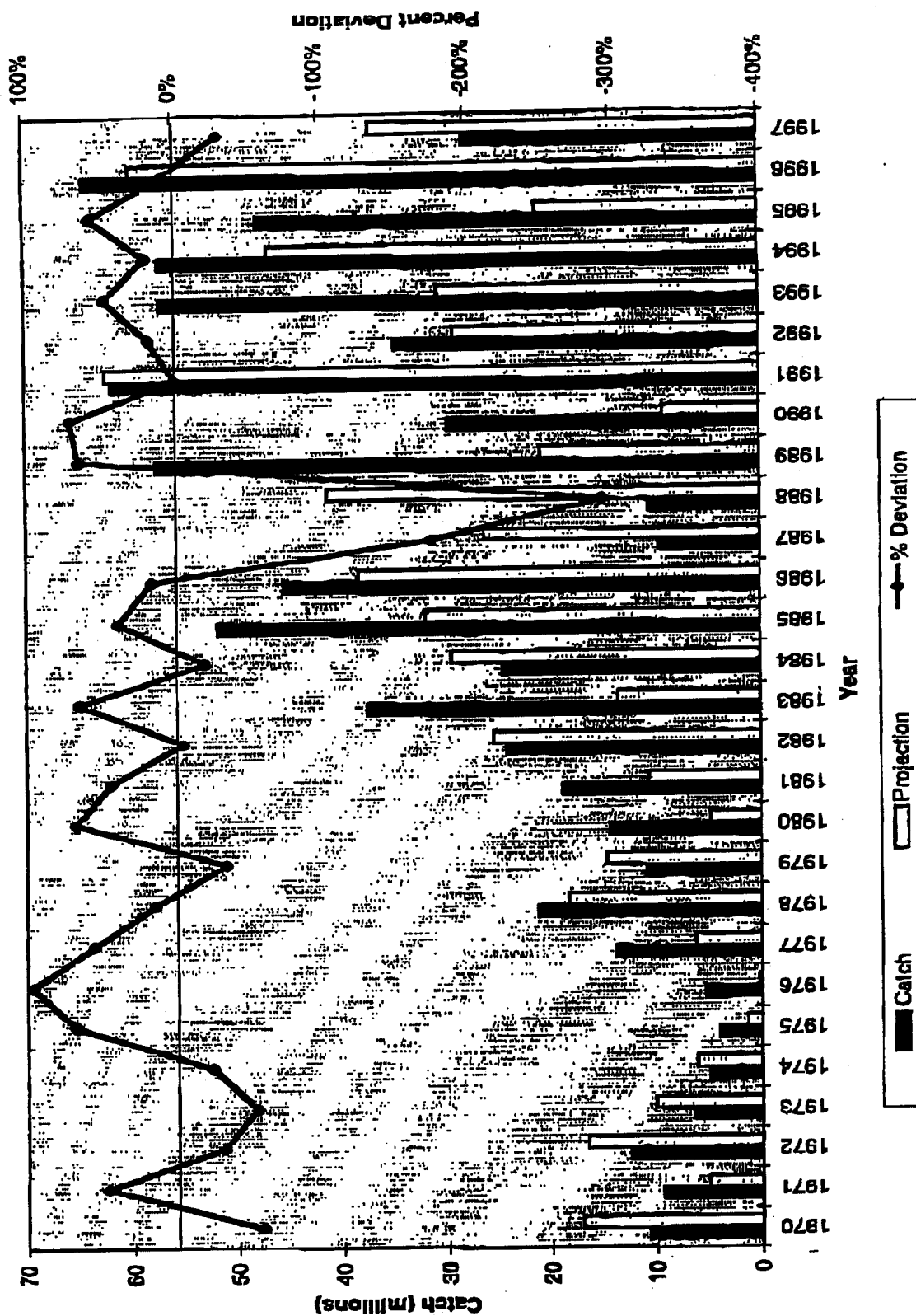
ATTACHMENT 9

Prince William Sound Pink Salmon



ATTACHMENT 10

Southeast Alaska Pink Salmon



ATTACHMENT 11

Bristol Bay Sockeye

Year	Catch	Projection	% Deviation
1970	20.721	32.563	-57.1%
1971	9.584	9.48	1.1%
1972	2.416	5.11	-111.5%
1973	0.761	1.49	-95.8%
1974	1.362	0.2	85.3%
1975	4.828	2.4	50.3%
1976	6.27	5.7	9.1%
1977	4.71	2.7	42.7%
1978	9.7	6.3	35.1%
1979	21.429	13.2	38.4%
1980	23.7	37.1	-56.5%
1981	25.71	21.2	17.5%
1982	15.1	29.1	-92.7%
1983	37.3	21.6	42.1%
1984	24.684	15.3	38.0%
1985	23.47	20	14.8%
1986	15.88	12.3	22.5%
1987	16.04	8.7	45.8%
1988	14.62	18.56	-26.9%
1989	29.3	17.6	39.9%
1990	33.2	16	51.8%
1991	29.3	23.1	21.2%
1992	34.5	28.8	16.5%
1993	43.7	34.9	20.1%
1994	36.8	43.2	-17.4%
1995	44.4	40.3	9.2%
1996	29.6	34.6	-16.9%
1997	12.3	24.8	-101.6%

ATTACHMENT 12

ALASKA DEPT OF FISH AND GAME

COMMERCIAL FISHERIES MANAGEMENT AND DEVELOPMENT DIV.

1997 Salmon Season /1

Forms: Salmon 97.xls

AREA	species	avg. wt.	Price per pound	No. Fish (thousands)	Lbs. Fish (thousands)	Est. value (thousands)
SOUTHEAST						
	CHINOOK /2	17.00	\$1.80	270	4,590	\$8,260
	SOCKEYE	6.50	\$0.90	2,400	15,600	\$14,040
	COHO	8.00	\$0.75	1,250	10,000	\$7,500
	PINK	4.00	\$0.16	26,400	113,600	\$18,160
	CHUM	6.50	\$0.25	10,400	88,400	\$22,100
	totals			42,720	232,180	\$70,080
PRINCE WILLIAM SOUND						
	CHINOOK	24	\$1.25	50	1,280	\$1,570
	SOCKEYE	6.40	\$0.90	4,110	28,300	\$23,670
	COHO	7.50	\$0.50	60	420	\$210
	PINK	3.75	\$0.12	25,434	86,050	\$10,330
	CHUM	6.50	\$0.30	2,350	19,840	\$5,880
	totals			0	133,980	\$41,770
COOK INLET						
	CHINOOK	16.40	\$ 1.10	13	230	\$260
	SOCKEYE	6.58	\$ 1.10	4,320	28,320	\$31,150
	COHO	6.50	\$ 0.76	150	960	\$720
	PINK	3.00	\$ 0.08	2,740	8,230	\$680
	CHUM	6.70	\$ 0.20	90	630	\$130
	totals			0	38,370	\$32,910
STOL BAY						
	CHINOOK	16.40	\$0.50	80	1,250	\$630
	SOCKEYE	5.90	\$0.85	12,350	72,850	\$61,920
	COHO	6.50	\$0.45	30	200	\$90
	PINK	3.50	\$0.06	0	0	\$0
	CHUM	6.50	\$0.17	260	1,710	\$290
	totals			0	76,010	\$62,930
KODIAK						
	CHINOOK	10.00	\$0.70	20	180	\$150
	SOCKEYE	5.30	\$0.90	2,500	13,250	\$11,930
	COHO	6.50	\$0.50	300	2,550	\$1,280
	PINK	3.80	\$0.12	10,750	40,850	\$4,800
	CHUM	6.50	\$0.20	470	4,020	\$800
	totals			0	60,860	\$18,030
CHIGNIK						
	CHINOOK	15.50	\$0.43	30	470	\$200
	SOCKEYE	6.30	\$0.70	720	4,520	\$3,170
	COHO	7.80	\$0.25	60	450	\$110
	PINK	3.30	\$0.10	840	2,780	\$280
	CHUM	7.90	\$0.09	150	1,210	\$110
	totals			1,800	9,410	\$3,860
AK PENVALEUTIAN IS.						
	CHINOOK	16.10	\$0.80	20	270	\$220
	SOCKEYE	5.77	\$0.80	4,280	24,880	\$22,210
	COHO	7.83	\$0.40	150	1,150	\$460
	PINK	3.30	\$0.10	2,320	7,650	\$770
	CHUM	7.01	\$0.10	680	4,640	\$680
	totals			7,420	38,390	\$24,120

ATTACHMENT 12

YUKON KOKWIM

CHINOOK	16.20	\$0.28	50	780	\$220
SOCKEYE	7.10	\$0.42	120	870	\$370
COHO	7.54	\$0.33	170	1,250	\$410
PINK	2.71	\$0.10	0	0	\$0
CHUM	7.25	\$0.12	70	480	\$80
totals			400	3,380	\$1,050

YUKON /3

CHINOOK	20.70	\$2.43	110	2,330	\$5,870
CHINOOK ROE		\$1.10	0	3	\$4
COHO	6.90	\$0.40	30	240	\$100
SUMMER CHUM	7.10	\$0.09	100	680	\$60
SUMMER CHUM ROE		\$1.10	0	83	\$90
FALL CHUM	7.50	\$0.35	60	410	\$140
FALL CHUM ROE		\$2.00	0	1	\$2
totals			300	3,750	\$6,070

NORTON SOUND

CHINOOK	17.88	\$1.00	10	220	\$220
SOCKEYE	8.80	\$0.72	0	0	\$0
COHO	7.28	\$0.48	30	230	\$110
PINK	2.50	\$0.08	0	0	\$0
CHUM	7.42	\$0.11	30	250	\$30
totals			80	710	\$350

KOTZEBUE

CHINOOK	14.40	\$1.00	0	0	\$0
CHUM/5	8.00	\$0.18	140	1,140	\$180
totals			140	1,140	\$180

ALASKA TOTALS

CHINOOK	17.79		650	11,590	\$17,370
SOCKEYE	6.05		30,790	188,390	\$169,450
COHO	7.86		2,220	17,460	\$10,980
PINK	3.81		88,000	259,150	\$35,100
CHUM	8.35		14,790	123,520	\$30,350
SALMON ROE/4				90	\$90
totals			118,450	598,110	\$262,360

1/ Final figures may not exactly total up because of rounding and database used to calculate figures.

2/ Southeast chinook salmon includes Winter Troll figures from Oct 11, 1996 - April 15, 1997.

3/ On the Yukon River, the estimated harvest of salmon does not include approximately 137,000 chum salmon and about 800 chinook salmon taken to produce the total roe volumes listed.

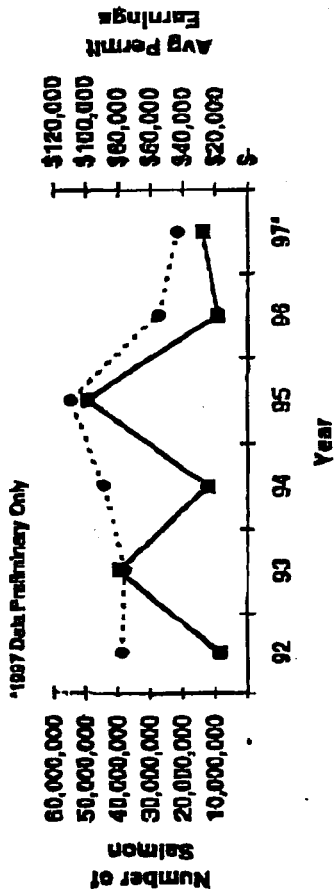
4/ Salmon roe figures here apply to those produced from directed fisheries on the Yukon River, and do not include indirect recoveries from other areas of Alaska.

The price per pound is based on the very preliminary reports from Area Management Biologists, and reflects only inseason exvessel value with no post season price adjustments.

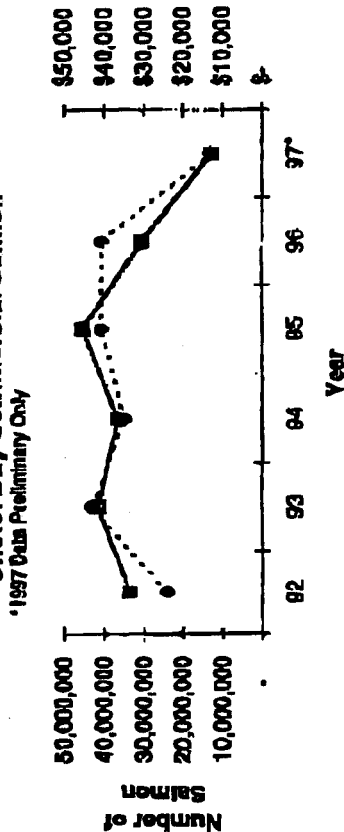
DATA ARE NOT FOR USE FOR ANY LEGAL INTERPRETATIONS. Updated 09-09-97

(Solid line) Catch, Dashed line is Value

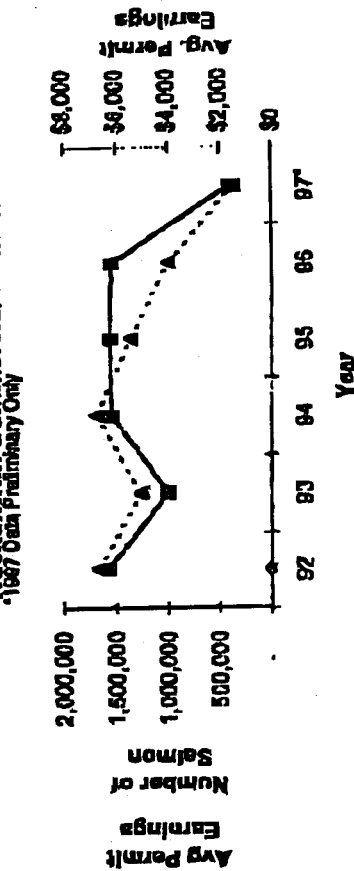
Kodiak Commercial Salmon



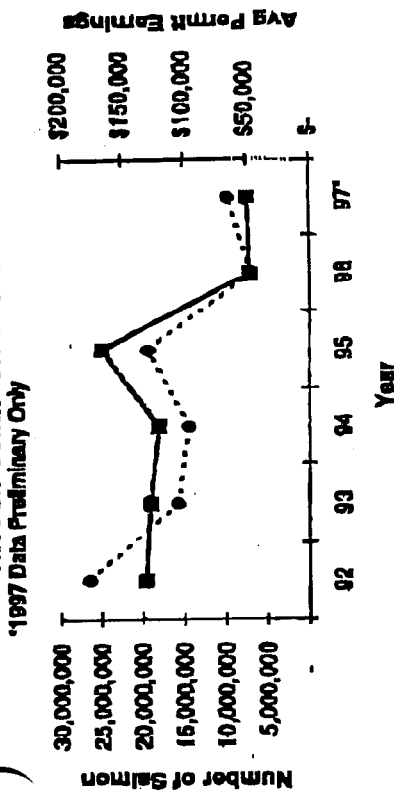
Bristol Bay Commercial Salmon



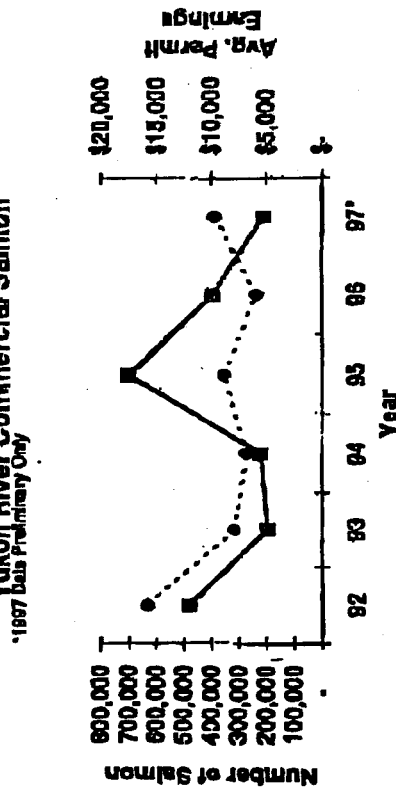
Kuskokwim Commercial Salmon



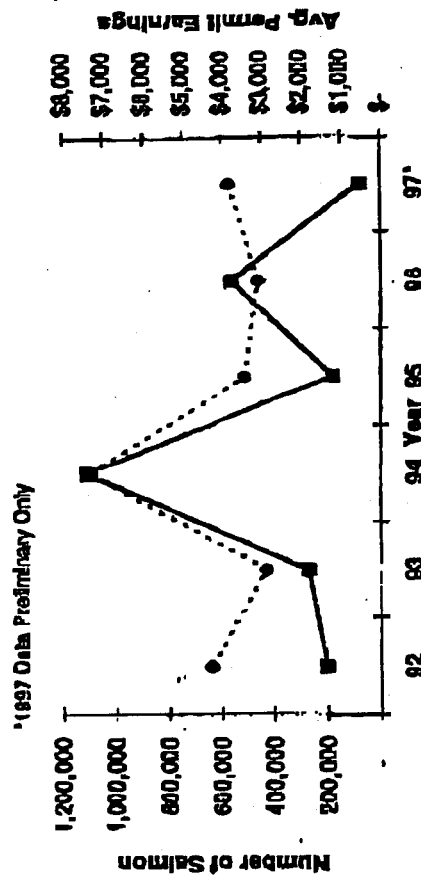
AK Pen Commercial Salmon



Yukon River Commercial Salmon



Norton Snd Commercial Salmon



ATTACHMENT 12

10-Sep-97

Filename: SakhalinExcelData.xls

For Mr. Geron Bruce, ADF&G, Commissioner's Office

1997 values based upon estimated total earnings divided by the number of permit holders fishing in 1996

From the TUX Fish Ticket Database